REMARKS

Reconsideration of this application, as amended, is respectfully requested.

THE SPECIFICATION

The specification has been amended to correct the informalities pointed out by the Examiner. No new matter has been added, and it is respectfully requested that the amendments to the specification be approved and entered, and that the objection to the specification be withdrawn.

RE: FIGS. 15 and 16

Figs. 15 and 16 have been amended to be labeled as Prior Art, as required by the Examiner. Submitted herewith is a corrected sheet of formal drawing which incorporates the amendments and an annotated sheet showing the changes made. No new matter has been added, and it is respectfully requested that the Examiner's objection to Figs. 15 and 16 be withdrawn.

RE: FIGS. 1 AND 10

On page 2 of the Office Action, the Examiner asserts that Fig. 1 should also be labeled as Prior Art "because only that which is old is illustrated." However, as described on page 8, lines 5-7 of the specification, Fig. 1 is a circuit diagram

showing an electric circuit example according to an embodiment of the present invention. Therefore, Fig. 1 has not been labeled as Prior Art, and it is respectfully submitted that the Examiner's objection to Fig. 1 be withdrawn.

On page 2 of the Office Action the Examiner also asserts that Fig. 10 should include capacitor C1 since Fig. 10 is the equivalent cell circuit diagram of Fig. 9. However, it is respectfully pointed out that in Fig. 9 reference C1 implies the parasitic capacitance of diode D1. In the equivalent circuit shown in Fig. 10, the parasitic capacitance C1 of the diode D1 does not need to be considered. Therefore, it is respectfully submitted that capacitor C1 should not be shown in Fig. 10, and it is respectfully requested that the Examiner's objection to Fig. 10 be withdrawn.

THE CLAIMS

Claims 1-24 have been canceled, and new claims 25-30 have been added.

New claims 25 and 26 have been added to more clearly and more positively recite the distinguishing features of the present invention in better compliance with the requirements of 35 USC 112.

New claims 27 and 28 are apparatus claims respectively corresponding to claims 25 and 26.

And new claims 29 and 30 are computer program claims respectively corresponding to claims 25 and 26.

No new matter has been added, and it is respectfully submitted that new claims 25-30 are in full compliance with the requirements of 35 USC 112. Accordingly, it is respectfully requested that new claims 25-30 be approved and entered.

THE PRIOR ART REJECTION

Claims 1-24 were rejected under 35 USC 102 as being anticipated by newly cited "General Purpose Symbolic Simulation Tools for Electric Networks," IEEE Power Industry Computer Application Conference, May 1987 ("Alvarado et al"). This rejection, however, is respectfully traversed with respect to new claims 25-30.

The present invention as recited in new claims 25-30 provides a simulating method, apparatus and program code configured to simulate the movement of charges in an electric circuit using particle models. And it is again respectfully submitted that the method, apparatus and program code of the claimed present invention does not at all relate to the conventional method of simulating a circuit, whereby Ohm's law is simply used to form a circuit equation.

More specifically, according to the present invention as recited in new claim 25, an electric network simulating method is

provided which comprises defining electric functions of a plurality of circuit elements as a plurality of element cells; defining intersections of wiring lines at which at least three circuit elements are connected as intersection cells; defining a wiring line in which the plurality of elements cells are connected as a pipe; defining a wiring line in which the element cells and an intersection cell are connected as a pipe; defining a wiring line in which the intersection cells are connected as a pipe; setting a rule of transfer of particle models between a plurality of pipes connected to the element cells and a rule of transfer of particle models between a plurality of pipes connected to the intersection cells; performing transfers of the particle models between the plurality of pipes connected to the element cells based on the rule set with respect to the plurality of element cells, and performing transfers of the particle models between the plurality of pipes connected to the intersection cells based on the rule set with respect to the intersection cells; repeating the transfers until variation in number of particle models and variation in quantity of movement of the particle models, in the plurality of pipes, converge; and determining the number of particle models and the quantity of movement of the particle models in the plurality of pipes.

Thus, according to the claimed present invention, an electric circuit is simulated by: i) defining intersection cells,

(ii) setting a rule of transfer of particles between the pipes in each element cell or intersection cell, and (iii) repeating the transfer of particle models in accordance with the rule until the number of particle models in the connected pipes becomes stable, as described in the specification of the present application with respect to steps S7 to S9 of Fig. 11. (See also attached Reference Figures A and B.)

That is, the electric circuit is defined as comprising element cells, intersection cells and pipes. A rule of particle model transfer is determined between the pipes with reference to the characteristics of the element cells. The transfer of the particle models is repeated, anywhere from 100 to 10,000 times. And the number of particle models in each pipe and quantity of movement of the particle models is determined.

It is respectfully submitted that Alvarado et al does not at all disclose, teach or suggest the method of simulating a circuit as according to the claimed present invention. In particular, it is respectfully submitted that Alvarado et al does not disclose, teach or suggest: (i) defining intersection cells, (ii) setting a rule of transfer of particles between the pipes in each element cell or intersection cell, and (iii) repeating the transfer of particle models in accordance with the rule until the number of particle models in the connected pipes becomes stable, as according to the claimed present invention.

In view of the foregoing, it is respectfully submitted that the present invention as recited in new independent claim 25, as well as corresponding apparatus and program claims 27 and 29 and new claims 26, 28 and 30 respectively depending therefrom, clearly patentably distinguishes over Alvarado et al under 35 USC 102 as well as under 35 USC 103.

* *

Entry of this Amendment, allowance of the claims and the passing of this application to issue are respectfully solicited.

If the Examiner has any comments, questions, objections or recommendations, the Examiner is invited to telephone the undersigned at the telephone number given below for prompt action.

Respectfully submitted,

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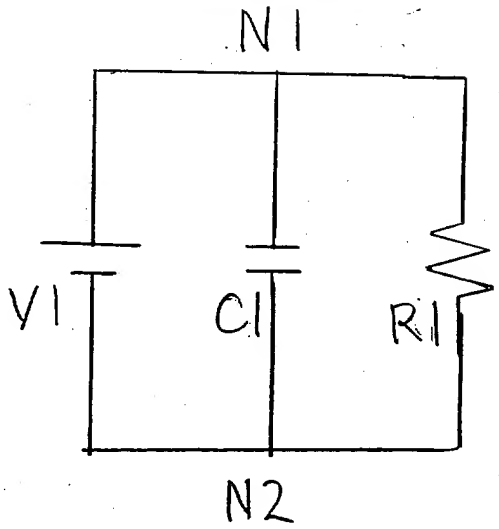
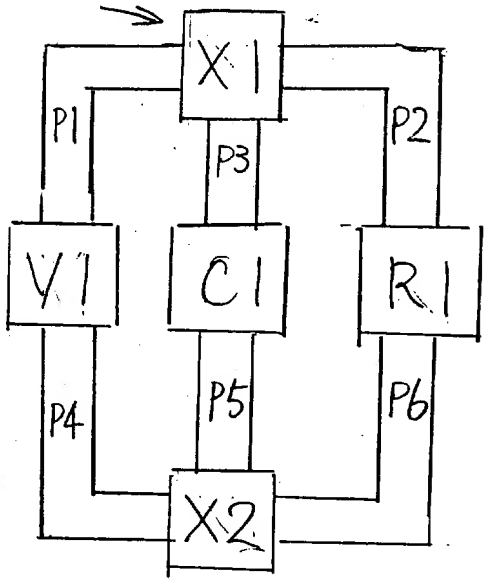
encs.

PRIOR ART



element	node	node
V1	N1	N2
R1	N1	N2
C1	N1	N2

PRESENT INVENTION



intersection cell

element cells	pipe	pipe	pipe
V1	P1	P4	
R1	P2	P6	
C1	P3	P5	
→ X1	P1	P2	P3
→ X2	P4	P5	P6

Reference Fig. A

Transferring particle models between connection pipes

		Pipe P1	Pipe P2	Pipe P3
First transferring	start	10000	0	0
	end	3333	3333	3333
Second transferring	start	5250	3333	3333
	end	3972	3972	3972
.....		.....	.....	.....
100th transferring	start	2334	2334	2334
	end	2333	2333	2333

Reference Fig. B

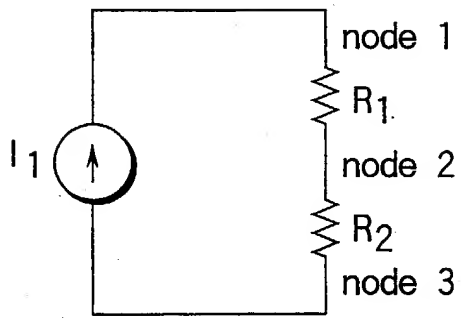


FIG. 15
Prior Art

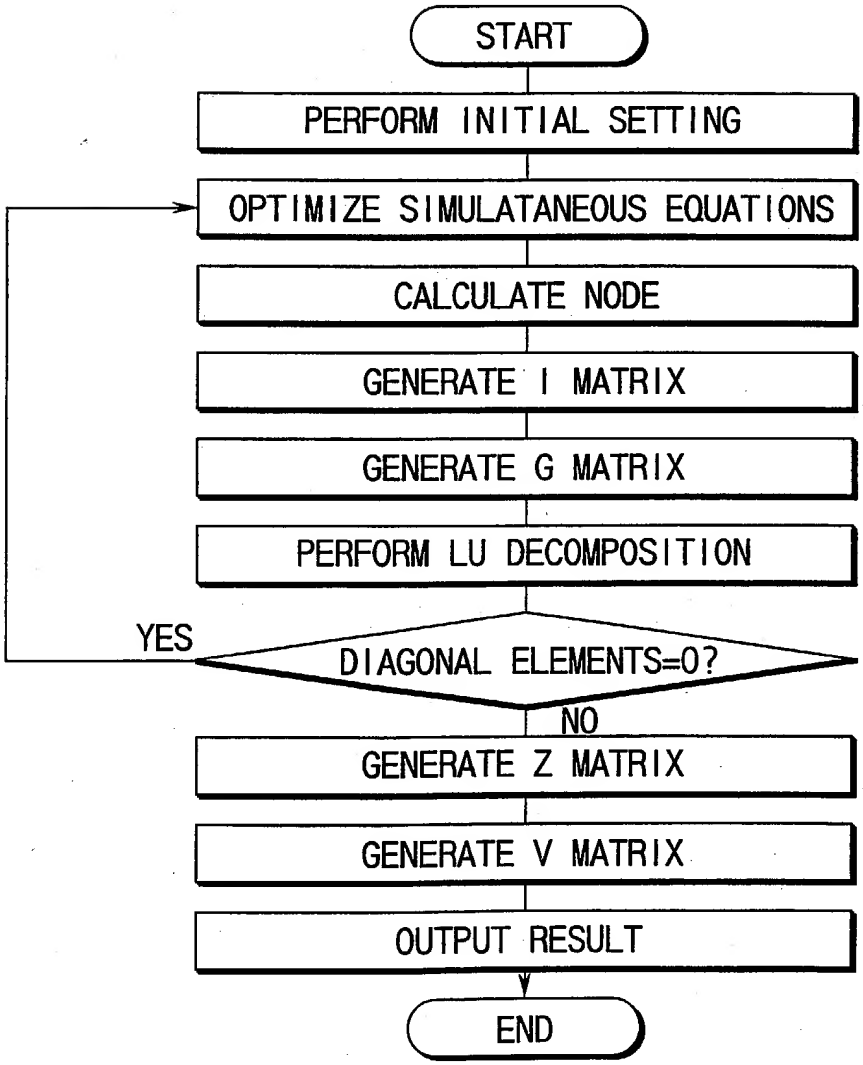


FIG. 16
Prior Art